

Regularly ovate, robust; antennæ rather longer than half the body, slender, filiform, scarcely thickened at their apex. Thorax more than twice as broad as long; sides narrowly margined, very slightly rounded, and converging from base to apex, anterior angles thickened; upper surface very minutely punctured; the usual longitudinal impression on either side at the base strongly marked, transverse groove distinct. Elytra rather broader at their base than the thorax, ovate, slightly narrowed towards their apex, very convex, impressed within the humeral callus with a curved semicircular depression. Hinder thighs strongly thickened, unarmed beneath.

Arsipoda rugulosa.

A. anguste ovata, modice convexa, obscure fulva, nitida; antennis extrorsum nigris; pectore, abdomine femoribusque posticis (basi prætermissa) obscure piceis, vertice elytrisque cupreo-æneis; thorace fusco-æneo.

Long. $2\frac{1}{2}$ lin.

Hab. Melbourne.

Facial ridge very broad, scarcely raised; facial plates transverse, separated from the front by an indistinct transverse groove, vertex minutely granulose: antennæ scarcely equal to half the length of the body, slightly thickened towards their apex; four basal joints, together with the bases of the fifth and sixth, fulvous—the first four stained above with picuous. Thorax more than twice as broad as long; sides slightly rounded, converging from base to apex; anterior angles obliquely truncate, slightly reflexed; upper surface irregularly excavated on the sides, closely rugulose, impressed a short distance in front of the basal margin with a faint transverse groove, which does not extend to the lateral border. Elytra rather broader than the thorax, irregularly punctured, their whole surface covered with irregular transverse rugæ.

L.—On the *Cocoa-nut of the Seychelles Islands, or Coco-de-Mer*.

By Mr. GEORGE CLARK, of the Seychelles.*

THE *Coco-de-Mer* is undoubtedly the most remarkable plant in this colony and its dependencies, one of which is the only spot in the world in which it is indigenous. The fruit was known long before the plant which produces it, or the locality in which it is found; and various fables were invented as to its origin, and marvellous virtues were attributed to its qualities. The few known specimens of it which existed were valued at an enormous price till, in 1742, the discovery of the Seychelles archipelago made known the habitat and nature of this singular production.

* Communicated by Dr. Bond.

The name "Coco-de-Mer," or Sea Cocoa-nut, was given in consequence of the first specimens of it which were known having been found floating in the sea, into which they had been carried by the streams; and some of these having been met with in the neighbourhood of the Maldive Islands, their name was added to that of Coco-de-Mer. When the Seychelles archipelago was discovered, three of the islands composing it, Praslin, Curieuse, and l'île Ronde were covered with magnificent forests of this unique palm, and their soil strewn with its huge and singularly shaped nuts. The value of their shells as domestic utensils for various purposes was at once perceived; and from that time to the present they have supplied to the inhabitants the place of buckets, bowls, jars, dishes, measures for grain and liquids, drinking-vessels, paint-pots, &c.; and they were extensively used among the labouring population of Mauritius until the diminution of the plant, and the great demand for the fruit which has arisen within the last few years in India and Persia, greatly enhanced their value.

The palm which produces this singular nut is the only member of its genus. Its systematic name is *Lodoicea Seychellarum*. It may be termed an equatorial plant, the islands on which it is found lying between $4^{\circ} 15'$ and $4^{\circ} 21'$ S. lat., and $55^{\circ} 39'$ and $55^{\circ} 49'$ E. lon. Its stem attains a height of 80 or 90 feet, and is quite straight, cylindrical, and smooth, but slightly marked throughout its length by the scars left by its fallen leaves. These scars are naturally more or less distant from each other, according to the rapidity of the growth of the plant. On the barren hill-sides they are scarcely 2 inches apart, while in the moist and fertile gorges they are as much as 3. The diameter of the stem varies, from the same causes, from 12 to 15 inches. A stalk so long and slender, crowned by leaves of vast size and strength, is necessarily much influenced by the wind; and in strong breezes the plants bend considerably, while their elasticity causes them to wave in the most graceful manner. The clashing of the leaves in a stiff gale produces a louder noise than I have heard from any other trees, and quite of a different nature; and the occasional fall of the ponderous fruit renders a passage among the Sea Cocoa-nuts a somewhat dangerous affair except in calm weather. I have heard of an instance of a woman's being struck by one while washing at a brook. A companion who was washing beside her was only made aware of the circumstance by the fall of the nut: the victim died without a cry or groan.

The stem of this, like other palms, consists of a mass of hard fibres, enclosing a medullary substance; but the fibrous portion of the stalk of the Coco-de-Mer is harder than that of any other

palm I know, and can only be cut by a sharp and well-tempered tool. The form of the stem likewise resembles that of most members of its family, its largest portion being that which rests on the surface of the ground. The root is in some cases bell-shaped, in others nearly hemispherical; and a vast number of rootlets radiate from it in all directions except upwards. These extend to a great distance around it, and form admirable stays to resist the strain to which the play of so long a lever subjects them; and so well do they perform their office, that I have never known an instance of a *Coco-de-Mer* having been blown down. I am aware that the same disposition of the roots exists in most other palms; but this by no means lessens the admiration due to such a perfect adaptation of means to an end. The rootlets are cylindrical, from half to three-quarters of an inch in diameter, and consist of a very hard bark enclosing a soft parenchyma. A beautiful exhibition of the roots is afforded where the palms have been burnt. The charred roots, almost as sonorous as metal, and as brittle as glass, show the great proportion of silex which they contain; and the numerous little tubes which radiate around have been left empty by the decay of the medullary substance which filled them. I have seen some instances in which the radius of these rootlets exceeds 12 feet. The leaves of the *Lodoicea* are winged and palmated, and bear a great resemblance to those of the Fan Palm. They are largest at the time when the stem is just appearing above the ground; and in favourable situations they may be found as much as 15 feet long (exclusive of the petiole, which is of an equal length) by 12 feet wide. As the trunk increases in height, the length of the petiole and the size of the leaf diminish. Did they not do so, the strength of the stem and its supports, great as it is, could not resist the effects of the wind with so great a leverage as the lofty stem would give. The leaves are destitute of prickles. The petiole is stout and grooved from its base to the leaflets, the folds of which converge to this canal, thereby pouring all the moisture which falls on them upon the stem. The edges of the petiole are sharp, and its base spreads so much as to embrace about two-thirds of the circumference of the stem; and some fibrous filaments, which spring from the lower part of the petiole, assist in maintaining it in its position. The middle of the petiole presents a longitudinal fissure, which appears like an accidental cleft: of this we shall presently see the use. The petiole is so strong, and so firmly attached to the stem, that a man may safely sit on its extremities, and even swing upon it. I only knew one man who would venture on this perilous feat. He was a native of the Maldivé Islands, settled at Seychelles; and among all the perilous gymnastics I ever beheld, none made me

shudder more than to see him seated on the leafstalk of a *Coccoloba*, at nearly 100 feet from rocky ground, rising and falling to the utmost extent the flexibility of the stalk allowed. He never met with any accident. The leaflets are of a glossy dark green on the upper side, and whitish green, slightly pubescent, on the under. They form a sharp fold, and are adherent in the greatest part of their length, the free ends growing longer as they recede from the centre of the leaf. The number of leaflets varies considerably; some fronds have upwards of ninety. Each fold is strengthened by a strong rib or nerve. The texture of the leaf is very strong, and of a complicated formation; it consists of three layers of fibres, enveloped in parenchyma. The two outer layers are longitudinal, and the centre transverse, and the epidermis itself is very strong. When the parenchyma and epidermis have decayed, the exposed fibres present much the appearance of coarse Scotch gauze. The leaf, previous to its unfolding, is covered with a thick fawn-coloured down, of a cottony feel. When the trees were numerous, this down was collected in sufficient abundance to form the stuffing of mattresses and pillows for the Praslinois. The most attentive observation leads to the belief that one leaf is produced every year, and from the scars left by their fall the age of the tree may be computed. Reckoned by this standard, some of the trees must be nearly four hundred years old.

The male and female flowers are produced on separate trees. The spadix which supports them springs from the same circle of insertion as the leaf which accompanies it; but, instead of rising from the axil of the leaf, it passes through the fissure of the petiole. The spathe, in both, is composed of three fibrous bracts, fitting one into the other, and opening by a longitudinal fissure on the outer side. The first bract, and generally the second, are concave on that side which is against the tree. The top of the first bract forms a sharpish edge; that of the second is pointed, and remains fixed between the tree and the upper part of the fissure of the petiole, thus supporting the weight of the spathe, while the top of the third bract, which is also pointed, is free. In the male flowers, the spathe is terminated by a catkin of 2 or 3 inches in diameter, and sometimes nearly 4 feet long, cylindrical, and rounded at the end. It is covered with brown scales closely imbricated, but so sloped at the ends as to allow the flowers to issue. These openings form symmetrical spiral lines round the catkin. A transverse fracture of the latter exhibits a series of reticulated tubercles, radiating from the axis to the circumference. These tubercles, which are nearly the shape of a *Nautilus*-shell, consist of an assemblage of about twenty sessile blossoms in various degrees of maturity, and form

a reserve in the interior of the catkin. They appear one or two at a time at the floral opening, to blow and fall in their turn. This most curious arrangement prolongs the blossoming of a catkin to the unequalled period of six or eight years. The calyx of these flowers is prismatic and entire, and slightly cleft into three unequal lobes. The corolla is composed of three little linear petals, concave at their extremity, and alternating with the divisions of the calyx. The stamens are from twenty to thirty in number, and the anthers slightly sagittiform. The pollen is yellow, and, seen through the microscope, appears much like grains of barley, not only in shape, but also in being furrowed longitudinally—a form common, I believe, to the pollen of palms in general. A gummy exudation, of a rather strong and peculiar smell, covers the surface of the catkin. In the female flowers the spadix is simple, as in the males; but, instead of growing in a straight line, it forms a zigzag, from the angles of which the flowers spring. These flowers are about 3 inches in diameter. The calyx is sessile, and is formed of two circles of bracts, three in each circle, firmly imbricated, and almost enclosing the ovary previous to its fecundation. The calyx is attached to the spadix by two oval bracts; but these remain attached to the spadix, while the calyx falls with the fruit. The flower has neither corolla nor style. Three sharp, persistent, sessile stigmas rest on the top of a fibrous drupe, generally a little compressed vertically, two-, sometimes (but rarely) three-sided—in the former case containing a 2-lobed nut, in the latter a 3-lobed nut. It also sometimes happens that two 2-lobed nuts are contained in the same drupe, and this is less rare than to find one with three lobes. This drupe attains a length of upwards of 15 inches, and a circumference of more than 3 feet, weighing from forty to fifty pounds.

About three years after fecundation the fruit has attained nearly its full size, and is then called *Coco tendre*. It may, in this state, be easily cut through with a knife, and exhibits in an interesting manner the different substances of which it is composed. First externally is the drupe itself, green on the outside and whitish within, of a harsh taste and astringent quality, like that of the ordinary cocoa-nut. Next comes what will form the hard shell of the nut. This is lined with a layer of a white feculent substance, almost tasteless. This covers a yellow matter, very bitter and said to be poisonous, which envelopes the perisperm, a jelly-like mass, presenting much the appearance of cold starch very slightly tinged with blue. This has a sweetish taste, and is considered cooling, and is much esteemed by the Seychellois. In the centre of this, at the point of junction of the two lobes, lies the embryo. In the mature state, which is not till seven or

eight years after the fecundation, the drupe has become fibrous, and from a rich dark green has turned to a reddish yellow, and falls from the stem. Germination takes place sometimes before, sometimes after, the fall of the fruit, the shell of which is hard and black, and marked all over by traces of the fibres which were inserted in it; and a bunch of these fibres, much resembling coarse black hair, remains in the orifice from which the germ sprouts. The yellow bitter substance has become a leathery skin, enclosing the perisperm; and the soft jelly-like mass has been condensed into a tasteless kernel, as hard as beech-wood, of a pure white colour, leaving a large cavity in each lobe of the nut; and at the point of junction of the two lies the embryo, of turbinated form. The germ, in passing through the orifice mentioned, becomes fibrous, assumes a club-shape, and curves towards the ground, which it penetrates. The radicle descends vertically, and from it sprout the rootlets. At a depth of 2 or $2\frac{1}{2}$ feet sprouts a fibrous leaf, at an angle of about forty-five degrees. This leaf seems to perform the office of a cotyledon to that which follows it, and which springs from its side. Each succeeding leaf becomes larger, and approaches more nearly to a vertical direction, till the crown is formed, when they succeed each other in the usual way. The trunk does not show itself till twenty or twenty-five years after the germination of the nut; and fourteen or fifteen years from this period the plant is in its greatest beauty, and begins to blossom. As many as eight or ten spadices may be seen on a tree at the same time, the male flowers, as has been said, retaining their bloom; and the female flowers seem to have the power of waiting an indefinite period for fecundation. Six or seven full-sized drupes may be sometimes seen on one spadix; but although as many as eight female flowers may be seen on one stem, it is rare to see more than three or four arrive at maturity. Imperfect fecundation often takes place, and a partial development of the drupe goes on. In this case it becomes deformed, assumes a curved shape, and falls a useless abortion. The *Coco-de-Mer* grows in every kind of soil, but attains its greatest size and beauty in the deep moist gorges of the mountains, where a rich bed of humus favours the growth of that as well as of other palms, some of which greatly surpass it in height. By the sea-side, and in situations much exposed to the wind, the *Coco-de-Mer* presents a somewhat barren aspect; its leaves, being renewed so slowly, are withered and rent, and the trees might be supposed to be dying. It has been observed that, at the discovery of the islands which produce it, vast forests of the *Coco-de-Mer* existed. The height and smoothness of the trunk rendered it a less difficult matter to cut down a high tree than to climb it, to obtain its fruit; and

thousands have thus wantonly been destroyed; so that a few years ago hundreds of male trees might be found without a single female among them. Many fires have also occurred in these woods, and a vast number have been destroyed in the conflagrations which have taken place. Five or six years ago a fire broke out at Praslin, which continued for several weeks, blazing up again and again after it was thought to be extinguished; and by this a very considerable number of these trees perished. On l'île Ronde not a plant remains. Curicuse, occupied as an establishment for the treatment of lepers, has a considerable number of fine young trees; and as this is government property, it is to be hoped that strict injunctions will be given to preserve every remaining tree, and also to plant others. If this be not done, it is not improbable that a few generations hence this unique and interesting palm will no longer be found. Its extremely slow growth has prevented most persons from planting it. There are not perhaps a score of trees in all the islands, except in Praslin and Curicuse. The growth of many young plants is stopped by cutting out the unopened leaves as fast as they appear, for the making of hats and other objects. These are called *cœurs-de-cocos*, and are very pretty objects. The leaflets are so compactly packed together that they seem to form a solid mass, as smooth as ivory. Their edges are of a most beautiful delicate green, and the lamina of a clear pale straw-colour. They form a material of unequalled quality for the making of hats and bonnets; and could they be supplied in sufficient quantity, a large trade in them might be carried on. A large bonnet-maker in England, who cleaned some for a lady from Seychelles, was particularly struck with the excellency of the material of which they were made, and said she could ensure a ready sale for any quantity of it. The splitting of the leaflets into strips of the desired breadth is a much more difficult affair than straw-splitting, on account of the transverse fibres which cross it. This operation is performed with considerable skill by those accustomed to it. They employ a simple little machine made of a piece of hard wood, with a sharp blade fixed in it. This blade is set at the required distance from a raised edge, which determines the width of the strip, and keeps it straight. The strips, however fine, can only be cut singly. Very useful and pretty little baskets, called *tentes*, are also made of these leaves. They last for many years, and by washing and bleaching may be always restored to their original colour. It is cut out into various tasteful patterns, and made into fans, which are much admired for their lightness and durability. Artificial flowers are also made of it, which want nothing but colour to be a good imitation of nature. Work-baskets (*corbeilles*) of great

beauty and in great variety are made by some of the Seychelles ladies, and some of these productions obtained much admiration and a prize at the Great Exhibition of 1851. The nerve which strengthens each leaflet is employed to stiffen hats made of the leaf, each seam of the rows of plat being sewed over it. This may also be split into fibres as fine as hair, and possesses considerable tenacity. I have seen a little basket of very complicated and delicate structure made of this material. It was manufactured by a lady of the Vendries family, which is unrivalled for the taste and skill displayed in the articles made from the *Coco-de-Mer* by its members. Mats of great beauty and unequalled durability are also made of these leaves. The extreme hardness and smoothness of their surface, and the length and strength of their fibres, are unrivalled by any substance within my knowledge. The expanded leaf forms an excellent thatch, nearly equal to shingles in durability. Its strength is so great that, when pinned together with little skewers of bamboo, it forms a basket capable of bearing nearly a bushel of fruit.

The petiole forms a strong and durable paling, and is also sometimes used for small rafters. The trunk, when cut into lengths and split into palisades, is used instead of boards for the sides of houses, and will last, I believe, as long as any wood. When split in two and hollowed, it is used for gutters for conveying water, and is almost imperishable. The size of the nuts varies greatly: I have seen some which would not hold a bottle, and others which were sixteen times as large. These extremes are rare; but a nut of ordinary size will hold from six to eight bottles. When intended to be preserved whole, they are left in a damp place till the perisperm has rotted away—a process which requires many months to complete: during this process it not unfrequently happens that flat-shelled snails introduce themselves into the nut, and grow too large to get out by the hole by which they entered, and die there, like the weasel in the fable. They are then called *Cocos légers*. They are then pierced with an auger at one end, or the extremity is sawn off; the orifice through which the germ sprouts is stopped up with a little pitch, and a withe round the cleft converts it into a convenient bucket, strong and light. When sawn longitudinally, it forms an elliptical vessel, called *Coco scié*, superior to everything else for baling out boats.

Three-lobed nuts are sometimes met with. I have possessed one with five lobes, and have heard of one having as many as seven. The kernel of the *Lodoicea* contains a portion of oil; but its excessive hardness, and the difficulty of detaching it from the shell (itself so valuable), render it practically useless for oil-

manufacture. The shell is about equal in hardness to that of the ordinary cocoa-nut, and equally susceptible of a fine polish. It is from $\frac{1}{10}$ th to $\frac{3}{16}$ ths of an inch in thickness.

The foregoing simple account of the *Lodoicea Seychellarum* proves it to be a most interesting plant in a scientific point of view, and a very valuable one in an economical one. It is therefore well worthy of the attention of the Government, as well as of private individuals, to use means, not only to prevent its extinction, but to favour its propagation.

At a recent meeting of the Linnæan Society (Nov. 3) letters were read from Sir H. Barkly, K.C.B., Governor of the Mauritius, and from Swinburne Ward, Esq., Civil Commissioner, in reply to the memorial of the Linnean Society relative to the wanton destruction of the Coco-de-Mer (*Lodoicea Seychellarum*). The Commissioner had reported to his Excellency that, although in many parts where the palm abounded it has been destroyed by accidental conflagration and by ruthlessly cutting it down to make room for Mandioc cultivation, yet that on the southern point of the island of Praslin he had found a valley surrounded by hills on the property of Mr. Campbell, the sides and crests of which were covered with the *Lodoicea*, several hundred in number, and in all stages of growth, from the sharp sword-shaped spathe just shooting from the ground to trees of 120 feet high. He ascertained that though no nuts were planted, some were allowed to remain and take root where they fell. The leaves of the male plants are cut for the sake of the material they afford, and which is used for making hats and baskets; but those of the male only, which preponderates over the female, are so cut. Cutting the leaves prevents the blossoming of the trees; but inaccessible specimens, which flower undisturbed, are quite sufficient to fecundate all the female plants in the district. In Curieuse comparatively few trees were found, and these smaller than those of Praslin; but directions have been given to keep up the supply by planting germinating nuts—in fact, to plant all the germinating nuts that can be found. A Coco-de-Mer with a healthy germ a foot long had been forwarded to Kew. The Governor stated that, as Praslin is almost entirely private property, the Government could only interfere in the way of exhortation and remonstrance, but that in Curieuse, which is still vested in the Crown, and used for a purpose which renders it inaccessible to the public, he trusted there would be no danger, under any circumstances, of the extinction of this interesting species.